

# A Look Back at the Impact of a Sustained Scientist-in-the-Classroom Program

The Vanderbilt GK-12/SCP  
Program: 2000-2013



# Personnel

- Dr. Virginia Shepherd, Vanderbilt Univ, PI
- Dr. Jennifer Ufnar, S. Vermont College, co-PI
- Dr. Susan Kuner, Topaz Canyon LLC and Vanderbilt University, evaluation team lead
- Jeannie Tuschl, MNPS, SCP Program Coordinator (2005-present)
- Dr. Vicki Metzgar, MNPS, GK-12 Program Coordinator (2000-2005)

# The Vanderbilt GK-12/SCP Program

- The Vanderbilt Scientist in the Classroom Partnership (SCP) began as an NSF-funded GK-12 program in 2000
- After seven years of NSF support, the program transitioned to the SCP in 2007
- Now in its 13<sup>th</sup> year, the GK12/SCP program has supported 121 Fellows working with 120 teachers in 5 high schools, 27 middle schools, and one elementary school.
- Fellows are recruited from all STEM disciplines at the M.S., Ph.D., and postdoctoral levels

# GK-12/SCP Partners

<b>Partner Institution</b>	<b>Description</b>	<b>Years</b>
Vanderbilt University	Private, Research I University	2000-present
Meharry Medical College	Private, Historically Black Medical College	2000-present
Tennessee State University	Public, Minority-serving university	2004-present
Fisk University	Private, HBCU	2007-present
Metropolitan Nashville Public Schools	Urban public K-12 school district	2000-present

# GK-12/SCP Program Components

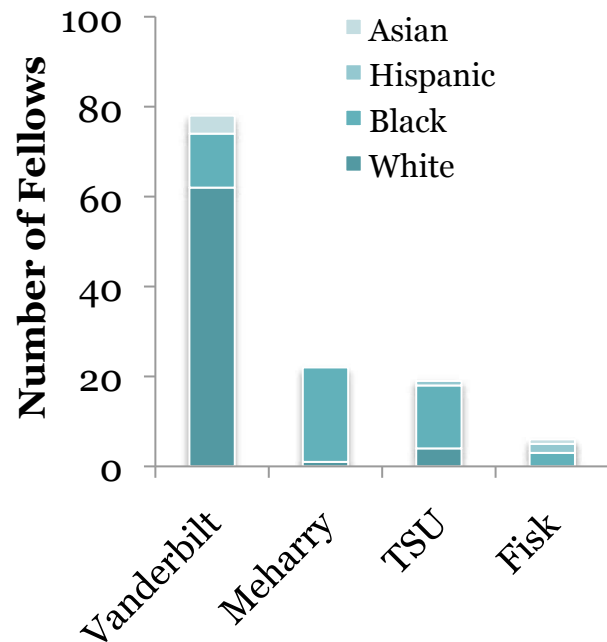
Component	GK-12		SCP	
	Time Commitment	Participants	Time commitment	Participants
In-classroom Co-Teaching	2 days per week	Fellows and Teachers	1 day per week	Fellows and Teachers
Summer Workshop	4 weeks	Fellows and Teachers	2 weeks	Fellows and Teachers
Academic Year Seminar	6 hrs/month	Fellows	3 hrs/month	Fellows
Academic Year Retreat	2 days/year	Fellows and Teachers	2 days/year	Fellows and Teachers

# Program Components

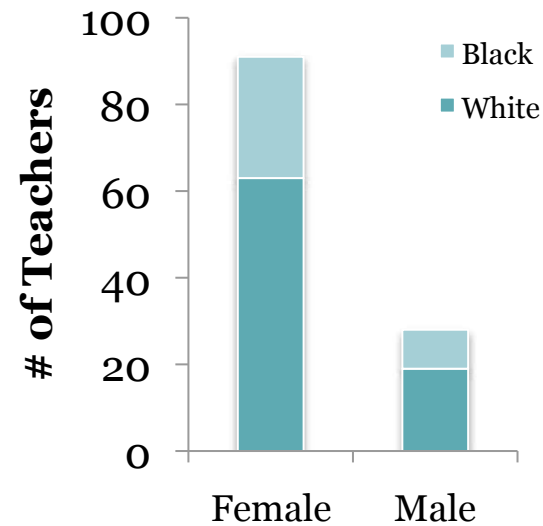
- Summer workshop (fellow and teachers)
  - Building fellow-teacher partnerships
  - Planning the integration of hands-on activities into the grade-level curriculum using Vanderbilt-developed or commercial science kits
  - Strengthening pedagogical knowledge of inquiry-based learning, science standards, classroom management strategies.
- Academic year seminar (fellows)
  - Fellows reflect on their experiences and provide feedback to improve the program
  - Fellows' progress is assessed to provide guidance on classroom experience and improvement in teaching skills
- In-classroom co-teaching (fellows and teachers)
  - Fellows work with partner teachers to develop and implement hands-on, inquiry-based activities; to provide classroom demonstrations

# Participant Demographics

**# Participating Fellows  
2000-2013**



**# Participating Teachers  
2000-2013**



# Retrospective Study

- In 2009 the Vanderbilt CSO was awarded an ARRA Challenge grant to conduct a retrospective study of 10 years of the GK-12/SCP program (2000-2009)
- The major goal of this study was to examine the impact of the program on participating teachers, fellows and students



# Study Team

- Dr. Virginia Shepherd, PI (Vanderbilt)
- Dr. Jennifer Ufnar, co-PI (Vanderbilt)
- Dr. Susan Kuner and Doug Robinson, Topaz Canyon LLC: qualitative research focusing on fellows and teachers
- The “Bob Squad”: Dr. Bob Crouch, former Director of the MNPS Research Office (currently Vanderbilt University); Dr. Molly Bolger, Arizona St Univ; Dr. Jack Willis, BrookBesor Consultants: quantitative student data analyses; qualitative research on fellows

# Study Methods: Analysis of Previous Data

- Fellow interviews
  - Questions: “What are the main goals for the students in the science classes that you teach?” “How has your training as a scientist prepared you for this experience?”
  - Sessions were audiotaped and transcribed for later coding
- Teacher interviews
  - Questions: “Now that the school year is well underway, how are your classes with fellows in them different from your classes last year?” “Is there anything about the experience that is not meeting your expectations?”
- Classroom observations
  - Study personnel made 18 visits to classrooms of 9 fellow-teacher pairs
- Online reflection journals for teachers and fellows
- Student interest surveys (2002 and 2005)
- Fellow Surveys (2002, 2005, 2007)
- Teacher Surveys (2005)

# Data Collected for the Retrospective Study

- Participant Information Forms
  - Fellows and Teachers: contact and demographic information, academic information (degrees and status), professional information about current position, and outreach activities
- Participant Surveys
  - Fellows and teachers completed an online survey consisting of ratings, ranking, and open-ended questions about their experiences in the program.
- Participant Retreat
  - 1-1/2 day retreat with past teachers and fellows
  - Focus group transcripts, storytelling

## Research Questions - Fellows

- Does the program increase the teaching effectiveness of the fellows?
- Does the program increase understanding of the K12 community by the fellow?
- Does the program increase the interest in teaching as a career?
- Does the program increase the fellow participation in future outreach efforts?
- Does the fellow see that the teacher partnership as an effective tool in increasing understanding of STEM concepts by students?

# Research Questions - Teachers

- Does the content knowledge of teachers increase due to the partnership with the scientist?
- Does the teacher's use of inquiry increase because of the program (both partnership with the scientist and summer workshop)?
- Do participating teachers engage in more science-related professional development than do non-participating teachers?
- How do the scientist-teacher partnerships influence the teachers' professional identity and teaching philosophy?

# Research Questions: Students

- Is there a difference in achievement between SCP participants and non-participants on the science portion of the state test?
- Is there evidence of reducing the gender and racial achievement gaps between SCP students and non-participants?
- Are scores higher on the ACT science reasoning section for students in classrooms with university scientists (Teaching Fellows, or TFs)?
- Are students more likely to attend classes on days with a Fellow?
- Are participating SCP students more likely to take elective high school science courses than non-participants?
- Is the graduation percentage higher for students from SCP classrooms than from non-participating classrooms?